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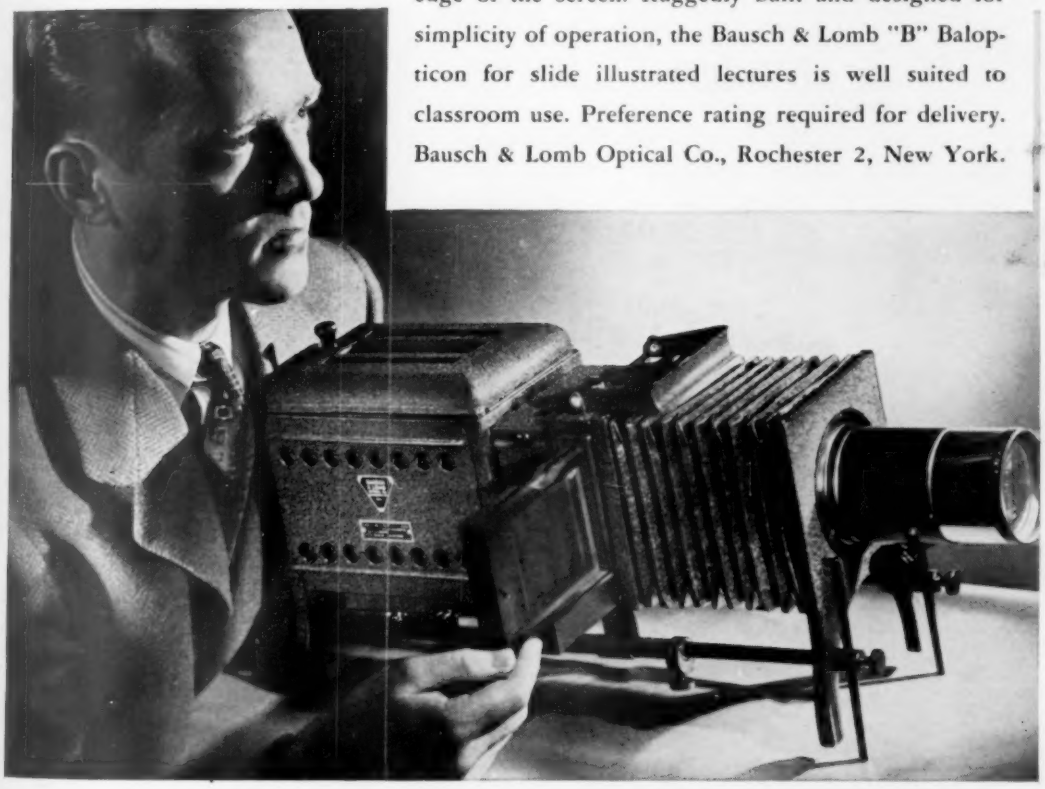

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Managing Editor—O. D. ROBERTS, 117 Harrison St., Oak Park, Ill.

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Science in Post War Education*

GUY F. WILLIAMS
Colby Junior College, New London, New Hampshire

A decade or so ago, it was a common thing to hear a speaker open his remarks on most any subject with these words "We are now living in a time of great change." But today you and I can say that we are living in the period of the greatest change in the history of this world.

Scientific applications, both technical and applied, have been instruments that have made such worldwide destruction possible. It is applied science and technology in the hands of the Allies that are going to stop this wholesale destruction. And scientific thought and application must be turned to in the restoration and reconstruction of war damages and in the attempt to create an enduring peace.

Science is here to stay for good or evil, either for a continuation of destructive changes or for constructive change.

After the wars are won and service men, war workers, and everyone else have attempted to return to civilian life, after regimentation and military coercion have been removed, democracy is going to be tested. It is in this testing that science in peace is going to manifest itself. Here scientists must accept a tremendous challenge to help in constructive and enduring education.

Education has molded the thoughts of the masses and it will continue to do so in time to come. I make no claim that that molding has always been good. In fact, education is always at the crossroads. There are those who do not agree on what constitutes an education. There is no agreement that it has been successful in the past, yet we must all agree that out of our millions of young men we have been able to develop an effective fighting force. It is true that curricula have been fragmented, courses have been factlessly taught, mastery has been neglected, and departmentalization has run rampant.

As controversial as education may seem, it is no more so that the religions, humanities, economics and politics of the time. Whether our thinking in education has been clear or not, science has been a potent factor in pre-war days,

* Address of the Retiring President of the New Hampshire Academy of Science, given at Concord, New Hampshire, November 3, 1944.

an all important factor in war days. We must not be satisfied to be the people's servant in post-war days, but master instead.

Doubtless among the mistakes in education in the past, science has made its share. The challenge from the American people and from the world is going to be a call for more aggressive steps toward greater cooperation in the molding of public opinion, and a more scientific method of attack on vice, selfishness and cynicism. The masses are going to look to scientists to show the way. In some ways, 100 physicists may be equal in importance to 100,000 men in the field, but effectiveness needs the complete cooperative effort and understanding of both.

In helping to make science assume its rightful place in leadership in post-war days, teachers of science must become the leaders in molding a political and economic world based on scientific methods of thought. Science teachers must play less the part of the introvert and more that of the extrovert.

In science teaching we have overdone departmentalization. We have divorced chemistry from physics, physics from biology. We have taught pure biology to the biology student and pure chemistry to the chemistry student. We have graduated liberally educated people whose scope of science may be that of one specialized semester or year. To meet the needs of scientific leadership in post-war days, our youth must face the world with the possession of the scientific method of thinking and a general knowledge of their natural environment, and some mastery of such natural laws as will enable them to understand that a penalty will be enacted in case of a violation of the laws. Teachers of science in school and college need to have an integrated knowledge of scientific subject matter. Instead of science being fenced off from liberal arts, scientific knowledge and thinking should be an integral part of a citizen's liberal education.

Science teachers should strive toward the goal that every youth who goes through school and college should be exposed to the major fundamental truths of the scientific world into which they are soon destined to plunge. If applications of scientific thought cannot make a peaceful world, then those same forces of science will be sure to help create agencies destructive to peace. Society demands leaders, and if they cannot do sound and constructive thinking, they will be likely to lead the masses into trouble.

Just as the gigantic integration of scientific endeavor has enabled us to reach the day when we can force our enemies' backs to walls, so an even more gigantic effort in integration is necessary to keep our peace. The education of the masses who formulate public opinion in a democracy is indeed a challenging job.

Science teachers need to help young people who will soon be the guardians of democracy by pointing out that natural truths are the best evidences of the existence of a supreme being. Herbert J. Muller in *Science and Criticism* says, "All in all science means a better life on earth, but cannot alone secure that end. The most that one can argue for is that it is an indispensable means, the best evidence for hope. Politics, religion, and sociology are valuable experiences and they suggest valuable means for dealing with the world; but science is based on definite knowledge, and is constantly enriching the world with more knowledge. And truth is the most certain knowledge to lead in partnership with the humanities to a less turbulent world."

Scientists must realize the need of educating to meet social problems. Our country has legislated on alcoholism, prohibition at one time, repeal at another. In the meantime, bootlegging as a means of escape has sprung up. Politicians have made alcoholism party platform material. The masses have thought on the problem scantily, falsely, and selfishly. Scientists must step to the front and teach the truth about the menace effectively and continuously. Such procedure may not win immediate results but it is the only democratic way toward a permanent solution.

Action springs from opinion of the masses, in a democracy, in peace times. Opinions must be built from factual knowledge guided by careful thinking. Scientists may make a big contribution to peace by stepping to the front and seeing that the youth of our country and the world are equipped with the two powerful instruments, ability to think clearly and possession of the basic facts of their natural surroundings.

Silent Teaching

HELEN FIELD WATSON
Senior High School, Mitchell, South Dakota

Two set-ups which a high-school biology laboratory should not be without, in my opinion, are a sealed garden and a glass bandbox for snakes.

Since the possessions—live and otherwise—in any school receive their appellations from students these are probably not the names used in your laboratory. Regardless of the name, no instructor can teach respiration of plants and photosynthesis as effectively with explanations as can a jar of successfully growing plants which has been sealed tight for a few months or a few years.

Our bit of northern Minnesota forest-floor taught for more than four years, having been opened only once (and that near the close of the period) for the removal of molds. Many other sealed gardens have lasted several months. One, started by a sophomore, had little nightshade plants blooming in it the year she was a senior. They had bloomed before and reseeded.

Mosses and ferns and other moisture-loving and shade-loving forms seem to succeed for us in captivity of this sort better than those of arid or even moderate situations. All the plants in the same jar should, of course, like the same environmental conditions. We tried a small cactus in with woodland flora, liking the artistic effect, but this conservative plant was apparently not at home among that group of drinkers.

To start a sealed garden select a sizable glass jar with a screw top. Place sawdust or pebbles or both in the bottom to the depth of an inch or so. Use soil of the sort your plant needs: if forest plants, then forest soil; if sphagnum, then the slightly acid peat from that region; if lawn weeds, then lawn soil. Introduce the roots with care as in any planting, then use the amount of water you think advisable. This is the only tricky part of the set-up.

Place the lid on lightly to prevent evaporation but do not seal it for a few days until the roots have started functioning and the plants seem to have recovered from the transplanting. Then, screw on the lid as firmly as possible. If you wish to brush paraffin around the edge of the lid the demonstration may be even more convincing. Somewhere on

"That lid's on tight. How can they grow without air?"

the jar or lid write the date when sealed.

Set it in desirable light. If these are woodland plants they will, of course, need diffused light. Some of our jars of lawn weeds this year can stand the direct sunlight through two thicknesses of glass in south windows. Apparently they are acclimated to South Dakota. Clover, mustard, and a clump of some grass make a really attractive closed garden—in this case a miniature lawn. The dandelions which were introduced absconded for some reason.

If students fail to notice the sealed jars among the other plants, set one on your demonstration desk. Then someone begins to think about it, usually aloud. "Why, that lid's on tight. How can plants grow without air?" Then he reads the label. "And no water since that date?"

Well, you who teach know how to write the sequel.

This fall, one of my students on a field trip found a naturally sealed garden—a small bottle with dried mud forming the stopper and a small plant growing inside. Usually animal forms excite students much more than plants but this was the high-light of this year's finds.

The other helpful set-up I mentioned is probably already in most laboratories—a terrarium, or snake-house, or toad-house, or Sal's Place, or whatever your sophomores may choose to designate it. Balanced aquaria are excellent teaching units and we always have from two to several of varying sizes. Perhaps it is because unbalanced goldfish bowls are so common in homes that aquaria arouse less interest than terraria.

We have one large glass bottle—a globe of about fifteen inches diameter with a neck of seven or eight inches—for a snake-house. Soil in the bottom can be moistened and planted with wheat, milo, or corn and the place is ready for occupancy. It can even be corked so that skittish students—and in this case the teacher also—will feel more comfortable.

You, no doubt, find that no matter how luxuriantly the green plants are growing in a vivarium of any kind someone will slip the plate-glass cover aside to admit air. One appreciates the evidence of kindness, as you do when they come with one ant in the bottom of a quart jar with holes punched in the lid to give it air. But there are two lessons to be learned: one is the matter of photosynthesis and respiration of plants and the respiration of animals; the other is that experiments whether for demonstration or research must be left as found.

In the Herpetology Laboratory of the

University of Michigan Biological Station at Douglas Lake, Michigan, appeared one morning a typewritten document which indicated that graduate students, as well as high school sophomores, may err in the matter of what constitutes kindness to animals. The snakes were housed each in a glass "band-box," twelve to fourteen inches in diameter, with its ground-glass cover held down securely by a brick. The document read:

To Whom It Does NOT Concern

1. No, we are NOT suffocating these snakes. They have plenty of oxygen.
2. No, we are NOT starving these snakes. They have plenty to eat.
3. No, we are NOT crowding these snakes. They have plenty of room.

(and so on)

The sealed garden and the closed terrarium are living teaching aids which require little care. But they do teach.

"No, we are not smothering these snakes."

Vocabulary Study via Cross-Word Puzzle

M. BLANCHE COCHRAN
Scott Senior High School, Coatesville, Pennsylvania

Having completed a series of *Cross-Word Puzzles* on the different groups of plants and animals, I am keenly interested in the reaction of teachers to such a publication.

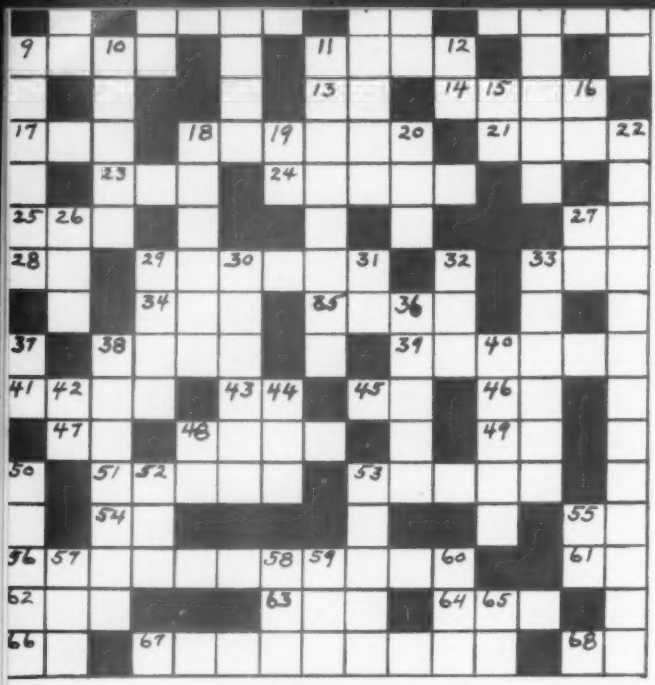
Over a period of 3 years I have found them to be very effective tools in biology vocabulary study. They stimulate interest in an educational hobby; aid in mastering biological terms; provide a quiz on vocabulary; supply leisure activity; stimulate final review; improve spelling and accuracy; supply that "something" needed on days before and following a vacation.

Believe it or not, 90% of the pupils actually like them. Many students who wouldn't spend 15 minutes on a regular assignment will "sweat" over a puzzle for an hour or more and think nothing of it.

Do you regard such a device as useful? My publication would contain a series of biological puzzles, similar to this one,* if science teachers feel they would serve a purpose.

Please send any criticism or comment to the author at Scott Senior High School, Coatesville, Pa.

* Editor's note: Two other puzzles in this series will appear in early issues, probably May and October.



Flower Parts

Across

2. Head garments
4. Postscript
6. Immature roses
9. For protection of young birds
11. Modified tooth
13. Preposition
14. Crowds
17. Backward; bashful
18. Produced by the anther
21. Part of a plant
23. Hawaiian wreath
24. All the sepals
25. "Too hot to handle" in tennis
27. Pair
28. Symbol for radium
29. Male reproductive part
33. Kitchen utensil
34. A metal
35. Corner
38. System of worship
39. Container
41. In the near future
43. H–K
45. Nickname
46. Latin conjunction
47. French (abbr.)
48. Fertilized ovule
49. 3.1416
51. Part of pistil
53. Part of corolla
54. Louisiana
55. Pronoun
56. Transfer of pollen from anther to stigma
61. Symbol for silicon
62. Alabama
63. Monday
64. An odd number
66. 450
67. Type of flower inflorescence
68. An article

Down

1. Pronoun
2. Cent
3. Sport played on horseback
4. Piece of fence
5. Symbol for tin
7. Type of flower inflorescence
8. Adverb
9. Attracts insects
10. Part of pistil
11. Part of stamen
12. General Motors
15. Suffix
16. South America
18. Female reproductive part
19. 50
20. New York City
22. Union of pollen grain with ovule
26. Part of a train
27. Post Office
29. To daze
30. Produces pollen
31. Negative
32. Ivan's nickname
33. Stigma, style, ovary
36. Female gamete
37. Form of to be
38. Petals taken collectively
40. Part of calyx
42. Preposition
44. Lock and ———
48. South America
50. Protects the bud (sing.)
52. Boy's nickname
53. Unpleasant sensations
55. Form of "to be"
57. Aged
58. Ampere
59. Adverb
60. Negative
65. Symbol for neon

YOUR NEW MANAGING EDITOR

The masthead of this issue carries, for the first time since March, 1941, the name of a new Managing Editor, Mr. O. D. Roberts, of Oak Park, Illinois. The new Managing Editor graduated from the University of Illinois in 1936, with the degree B.S. in Education, majors in Biology and General Science. His special interests were the invertebrates, particularly the protozoa. He is at present enrolled in Northwestern University and expects to receive his Master's degree this spring. He has taught in Blue Island High School, Northbrook High School, Ottawa Hills High School and Oak Park High School, all in Illinois. Along with biology, he has at times taught chemistry, physics and general science. He has also acted as dean of boys and vocations counsellor.

This is your official welcome, Mr. Roberts, to a position of real responsibility. Your new job will prove most interesting. You are assured of the cooperation of an active and enthusiastic staff of associate editors and advisers.

JOHN BREUKELMAN

Lupinus in Mt. Rainier National Park. Large wild flower displays are now found mostly in distant and isolated fields and mountain meadows. Photo by A. Curtis.

Conservation Series, Unit V
Wild Flower Conservation

P. L. RICKER
President of the Wild Flower Preservation Society, Washington, D. C.

The real problems in wild flower preservation are much misunderstood by most of the general public and are often overlooked by the majority of teachers and well-meaning conservationists. The objectives of most of the workers have been largely of a sentimental and aesthetic nature rather than following lines of any practical value. Some have gone so far as to advocate no picking of wild flowers, even of such weedy ones as goldenrod and daisies. This attitude has thrown much discredit on the work, particularly among the botanical profession and explains in a large part their lack of interest and cooperation.

Most wild flowers were undoubtedly intended to be picked and enjoyed within reason by all flower lovers and except in very rare instances picking or digging has contributed an almost infinitesimal part to their disappearance.

Clearing Land

It is evident to anyone, who will stop to consider the subject seriously, that since the first settlement of the country, the disappearance of wild flowers has

Upper, *Birdfoot Violet*, state flower of Wisconsin, grows only in very acid soil, and is very difficult to cultivate. Photo by E. L. Crandall.

Lower, *Trailing Arbutus*, state flower of Massachusetts, is extensively destroyed by pulling up its long flowering runners. Protect it by cutting short flowering stems. It is very difficult to cultivate. Photo by C. R. Shoemaker.

been increasing very rapidly, but almost entirely from fires, grazing, and the clearing of land for farms, homes, factories, roads, railroads, and recreation purposes. These will continue to be the principal factors, and laws are of little or no value in wild flower conservation as they can stop none of these agencies.

While the process of land clearing in the east has been comparatively slow, in the middle and far west it has increased by leaps and bounds. On the Pacific Coast near Bakersfield, 5,000 acres of the most attractive wild flower land of the region was plowed up and put into grain.

In the midwest, plowing 5,000-acre plots has been just a drop in the bucket. In the Detroit region commercial and home expansion has increased to such an extent a high-school biology teacher reported that it was almost impossible for her to find wild flowers for class use for long distances out of the city. In the Great Plains States conditions are nearly as bad, but large cultivated fields are the main factors there instead of homes and factories.

In most parts of the country one has to go long distances from the larger towns and cities to find an appreciable number of wild flowers and many of the best areas are in the most inaccessible mountain districts. Here fortunately many of the best wild flower displays will doubtless remain indefinitely where they are not open to grazing. Notable among these are the Atlantic and Pacific Coastal mountain range skyways and the National Parks. The Shenandoah National Park area, excessively grazed and lumbered for 100 years or more showed a marked increase in the wild flower display on grazed areas two years after the grazing was stopped, the most notable of which was the Big Meadows area.

The North Carolina coastal plain has always been one of the best eastern floral displays, but five extensive war training camps, adjacent war projects and homes for workers have caused extensive destruction of thousands of plants such as orchids, pitcher plants, and Venus Flytrap.

Picking and Sales

The picking and sale of Trailing Arbutus is an exceedingly small factor in its disappearance. Nurserymen are contributing extensively to the disappearance of many wild flowers by digging them for direct sale, or transplanting to their nursery for eventual sale to wild flower garden enthusiasts, a great many

California Poppy, the state flower, formerly carpeted most of the hills with sheets of gold. Photo by G. E. Stone.

Thousands of cords of *Flowering Dogwood*, the state flower of Virginia, have been cut for shuttles. Pennsylvania is planting it along the high-way from Valley Forge to Washington's Crossing of the Delaware. Photo by A. S. Hitchcock.

of whom have the idea that such gardens contribute to wild flower preservation. Mostly they do not, for a great many of the plants die within a year or two for lack of proper care or suitable soil, moisture or light conditions that are rarely factors in many of the cultivated plants that have been propagated by nurserymen from seeds, cuttings or root divisions for many years.

Only a very small proportion of wild plants sold for gardens are propagated by nurserymen and they will not be propagated as long as they can dig them readily from the wild.

Two officials of the *Wild Flower Preservation Society* have spent much time in the field, all over the country, for the past twenty-five years investigating wild flower growing conditions, their disappearance, and visiting wild flower nurseries, gardens, and preserves. Some of the nurserymen that have been extensively criticized by well-meaning conservationists have collected much of their stock from areas that have later been cleared for lumber, pastures, farms, homes and golf courses, and the plants would have been destroyed anyway.

Commercial Uses

One of the most outstanding cases in the east is that of the Mountain Laurel. Only one small stand of it is known in Maine where it should be protected in every way possible, but beginning in the Berkshires of Massachusetts it becomes increasingly weedy the further south one goes and becomes only slightly less abundant in the southern limits of its range from west Florida to Louisiana. In some parts of the mountains of North Carolina it has reached tree size with a trunk at least six inches or more in diameter. In Connecticut where it is very abundant

an ineffective law is supposed to protect it. In North Carolina the recent use of its root burls for pipe bowls raised a great outcry by clubs all over the State and many other parts of the country at their instigation. These burls are found mostly in very inaccessible areas and only in damp or soggy ground along small streams. They constitute less than 1/100 of 1 per cent of the total stand of Laurel in that state and the much greater bulk of the Laurel in dryer soils do not have burls. The thickets are so dense and often distant from roads, that an unlimited use of the burls could make but very little difference in the total supply. Few if any of the burled areas are near to, or visible from even second-class roads. This is an uncalled for protest that has done the conservation cause more harm than good.

Flowering Dogwood, extensively used in North Carolina for spinning mill shuttles, has become so scattered that its commercial cutting is becoming unprofitable and the mills are looking for a more abundant substitute; yet these same clubs have let the Dogwood destruction go on for the past 50 years or more with no protests; not that their protests would have done any more good, as will be noted later.

In addition to use for pipe bowls, Mountain Laurel foliage is probably more extensively used from the Connecticut and New York areas by florists for decorative purposes than any other native American plant. It has been estimated that New York City florists alone use 1,000 tons a year.[1] Boston and Philadelphia florists are estimated to use 200 tons a year and those of Baltimore and Washington about the same amount. Farmers in many areas regard it as a bad weed and are glad to get rid of it, but it

[1] BUTTRICK, P. L. The Mountain Laurel. *Marsh Botanical Garden of Yale University Publication* 1: 20. 1924.

Pink Ladyslipper requires very acid soil and rarely survives long in cultivation. Photo by E. T. Wherry.

Arethusa is a comparatively rare orchid of the cool northern bogs. Photo by P. L. Ricker.

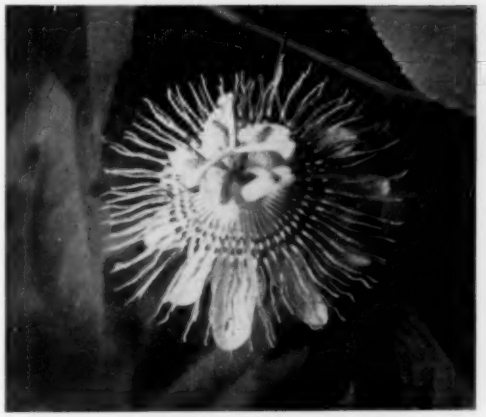
grows and spreads so rapidly with all of this destruction that its extermination is practically impossible. Fires annually destroy a far greater area than is cut over for florists and still it recovers and spreads. Can anyone reasonably object to the commercial use of such a plant that 50 or more years of extensive use has made little or no appreciable reduction in its abundance?

North Carolina for over 50 years has been the center of a very large industry in the collecting of crude drug plants and to a lesser extent this business extends into many other parts of the country. Ginseng and Hydrastis have been nearly or entirely exterminated in most localities so that the drug trade now has to depend entirely on the cultivation of these two plants. Botanists however occasionally still find both wild in many of their old haunts, but they have become so scarce that their collecting from the wild is unprofitable.

Other attractive native plants extensively collected for the drug trade are Trailing Arbutus (as Gravel Plant), Trillium, Ladyslipper, Solomon-seal, Bloodroot, Blue-flag, Helonias (quite rare), Dogwood and Redbud bark, Pipsissewa, Twin-leaf, and many others. Galax is also extensively used by florists.

On the Pacific Coast it has been the mountain meadow members of the Lily Family and some of the evergreen shrubs used for Christmas decorations that have suffered the most, but the areas where they still and probably always will grow is so great that there is little or no danger of their extermination, even though many areas have been extensively depleted by the demands of wild flower gardeners.

On the Atlantic Coast Holly and Ground Pine have suffered the most seriously of any plants from ruthless cutting and digging for the Christman trade. In many areas the berry-bearing (female) trees have been almost entirely exterminated and the native collectors wonder why the remaining (male) trees bear no berries. As a result more than 30 middle eastern nurserymen and farmers are now actively engaged in propagating the best strains of American Holly for the Christmas market, and others who have "killed the goose that laid their golden eggs" should do so if they want to continue their income from that source.



Passion-flower occurs occasionally in southern fields and along roadsides, seeds abundantly, and is an excellent vine for southern homes. Photo by P. L. Ricker.

Wild Flowers Exterminated

One of the questions most frequently asked by schools is, "What wild flowers have been exterminated?" The one historic example is the extermination of Franklinia, a small tree with attractive flowers similar to those of the Loblolly Bay, from its only known locality of a very few acres on the Altamaha River near Fort Barryington, Ga., about 1790. All evidence indicates that this was done by early nurserymen and gardeners. Fortunately a very few trees propagated by nurserymen, mostly from cuttings, were kept alive. About 1908 the writer obtained over 100 cuttings from two slowly dying trees which were rooted by the late Dr. F. V. Coville and distributed

Wild Lupines, similar to the Bluebonnet, state flower of Texas, are found in nearly every state, but require very acid soil and are difficult to cultivate. Photo by C. R. Shoemaker.

to several nurseries some of which now have fair size stocks, but they require a sandy acid soil for successful growth.

A few herbaceous plants known from only one or two very small areas have been exterminated by lumbering, or the damming of rivers for power, or flood control purposes.

The most notable case is that of the wholesale destruction of millions of Iris plants in Louisiana coastal, and to a lesser extent in adjoining areas, by government agencies covering the bogs where they grew with several feet of mud pumped from the Mississippi Delta and adjoining Gulf areas.

Strenuous efforts were made by the late Dr. John K. Small and many nurserymen and gardeners to get plants established from seeds and roots in other localities. Some of the species have doubtless been very nearly if not completely exterminated and the days of many of the remaining ones are doubtless numbered.

In South America one European firm of orchid specialists sent an expedition to obtain a large stock of a rare and beautiful orchid known from only one locality. They are reported to have collected all plants that could be found and burned the area to destroy seeds, seedlings and any plants they did not find so that no other dealer would ever be able to obtain a stock of it but from them and at fancy prices.

Laws

Beginning as far back as 1915, when the first state law for the protection of native plants was passed by the Delaware Legislature, constantly increasing demands for such laws have been made, largely by garden and civic clubs until half or more of the states now have such laws.

These laws all aim to prevent the picking or digging of certain flowers or plants, supposed to be in danger of extermination. This by inference, from too much picking or digging, so that the public generally and teachers are left with the impression that the enforcement of such laws will go far towards the prevention of wild flower extermination. That impression however is entirely erroneous.

Laws for the protection of wild flowers have not been appreciably enforced in any state and have rarely acted as a deterrent to anyone desiring to pick rare wild flowers. The courts have held that wild plants are the property of the owner or lessee of the land and he cannot be prevented by law from picking or digging and selling wild plants, or from relegating that right to others, any more than one can be prevented by law from picking, digging or selling their cultivated plants unless they are reimbursed by the government for loss of such income. All are now familiar with government payments for the reduction of crops such as cotton. Most state constitutions forbid the state making such payments except for value received, or unless the plants, like ragweed, constitute a menace to the public health, when the

owner can be ordered to mow the weeds or have it done by the municipality at the owner's expense.

Wild Flower Preserves

Permanent Wild Flower Preserves offer the only practical means of protecting native plants and making them available to future generations. They are of inestimable value as food and nesting material for birds that destroy insects that destroy the farmers' crops and they form an essential ground cover on all wooded slopes, without which even the trees would not long survive.

Foresters estimate that wooded slopes hold back the delivery of rainfall and melting snows to the streams by 60 per cent. It is however very largely the mosses and small herbaceous plants that are responsible for this factor, and many of these plants will only grow in the shade of trees.

Most National and State Parks and Forests serve as wild flower preserves as do the thousands of acres included in State and Federal bird and game preserves, though in some of these there has been more or less extensive plowing and planting of grain crops in order to provide more birds and game for the so-called sportsmen to kill.

There should be permanent wild flower or general wild life preserves, if only as Town Wood Lots, in every county in the United States to provide food and nesting places for birds. Most Town Wood Lots soon become self-supporting and some yield a sufficient profit to help reduce local taxes. Nature Trails[2] should be laid out in them and weatherproof labels with useful information provided.

Landowners will often donate land for such purposes particularly if named for some member of the family. Unless the Preserves can be owned by a responsible incorporated organization of probable permanent existence they should be transferred to a State Conservation Commission.

Venus Flytrap is known only within about a hundred mile area in eastern North Carolina, but is abundant there. Photo by P. L. Ricker.

One of the first western New York preserves was started with 25 acres by obtaining local donations of $5.00 each from 100 interested individuals. Since then one or two additional tracts of similar size have been added to the holdings. This plan could doubtless be adopted in many localities.

Areas suitable for preserves are being cleared so rapidly in many parts of the country that it is only a question of another 25 or 50 years when such areas will be very difficult to find. Those interested in conservation should make a survey of their local areas best adapted for preserves and try to find means of securing one or more of them, as above indicated, before it is too late.

This is the fifth of a series of eight-page Conservation Units; for the benefit of those readers who have become acquainted with The American Biology Teacher only this year a brief explanation is perhaps worth while. The Representative Assembly, in its meeting in Chicago in 1943, set up a *Conser-*

[2] Ahrens, Carsten. Nature Trail, *The American Biology Teacher*, Vol. 5, p. 186, May 1943.

The *Large-flowered Trillium*, which changes from white to pink, grows rapidly from seed in gardens. Photo by C. R. Shoemaker.

ration Committee, under the chairmanship of Dr. E. Laurence Palmer, Professor of Rural Education at Cornell University and long-time friend and adviser of the journal. It was decided to print the series of units in eight-page form and to place them in the middle of the issue in which they appear, so that they may be removed without disturbing the rest of the issue, to be filed or bound together into a cumulative manual of aids in the teaching of conservation.

The list of previous units is as follows:

I. *Seven Keys to Wildlife Conservation*, E. Laurence Palmer, Cornell University, Vol. 6, No. 3, pp. 57–64, Dec. 1943. The seven keys are shelter, predation, room, highways, food, breeding stock and health.

II. *Our Nation's Health Lies in the Soil*, Ollie E. Fink, then Curriculum Supervisor, Conservation Education, State of Ohio, now Executive Secretary, Friends of the Land, Vol. 6, No. 6, pp. 129–136, Mar. 1944. Health-influencing factors in the soil and the teacher's part in bringing the knowledge to the people.

III. *Conservation of Fishes*, Howard H. Michaud, North Side High School, Fort Wayne, Indiana, Vol. 6, No. 7, pp. 153–160, Apr. 1944. Title is self-explanatory; emphasis on what can be done about the problems.

IV. *Biology and the Soils*, F. Olin Capps, Education Section, Conservation Commission, State of Missouri, Vol. 6, No. 8, pp. 177–184, May 1944. A detailed outline of the biological aspects of soil conservation practices.

The editorial board and the conservation committee plan to present other eight-page units in the future, perhaps about two per volume. The next one, which will probably appear in one of the early fall issues, will deal with some phases of the relation between insects and conservation. Any readers having suggestions for future units are asked to send them either to the editor or to the chairman of the committee, E. Laurence Palmer, Department of Rural Education, Cornell University, Ithaca, New York. Of course, the journal welcomes also any short articles and teaching aids for this important phase of biology.

A special *Conservation Issue* of The American Biology Teacher (Vol. 5, No. 4) was published in January, 1943, with Willis W. Collins, United States Army, as chairman of the special committee. This issue contained articles on conservation education, pupil activities, projects, field trips and other topics allied to conservation. Dr. Palmer's *The War Hits Succotash Biology* brought forth much favorable comment, as did the entire issue.

OUR RESPONSIBILITIES

We hear a great deal about "post-war" science planning, but are we, as biology teachers, doing our utmost with the "present-day war-time" responsibilities of teaching?

The majority of us are doing extra jobs besides our teaching—driving trucks, helping in hospitals and at the blood bank, working in stores—all extra responsibilities taking our time, effort and energy.

And the students? They likewise are working at after-school jobs, leaving little time for study, recreation and rest. They also have members of their families away on various fronts, are hearing war talk on every side, are helping with and contributing to various war efforts, until they become accustomed like their teachers to a concentrated, intensified living. What effect does this have on them and on ourselves? Are we able to do as satisfactory work as we would like to be doing? Are we helping youngsters to the best of our ability at a time when they need help, more than ever before in their lives, to maintain a stable adequate balanced viewpoint? Have we let our teaching cause slip into the background in our patriotic endeavor to help on all sides?

Students emotionally aroused and kept at a high tempo week after week, month after month, react as do adults. What can we do, as biology teachers, to keep their feet on the ground?

First, we are blessed in being biology teachers. Biology is a satisfying subject to the student. It is part of his daily environment, it helps to satisfy his need for knowledge about himself, his community and mankind. At the same time, it stimulates him with the hope and need for new and better knowledge necessary for the advancement of all branches of science. Biology permits us to talk war on the one hand with a realistic viewpoint of its effect on standards of living, on health, on problems of disease, on the emotional reaction of human beings. On the other hand, it permits us to discuss the new discoveries growing out of the war in regard to these same problems, the advancement of science gained through the needed impetus of war. Along with this, biology gives us an opportunity to show the student the advantages of his own environment, to help him to gain an appreciation of the aliveness and beauty of the land around him. Few people, student or adult, can stand on spring soil, see the wonder of another year unfolding, and not feel a thrill at this, *our* America. Isn't this, too, a part of our job—this task of instilling the belief of strength and dependability of our native soil?

From quite another standpoint, are we as teachers, because of our added duties and our concentrated war-time living, becoming less enthusiastic in our work, excusing ourselves from opportunities to improve ourselves and our teaching? Are we postponing until the future the opportunities to belong to up-to-the-minute science organizations that will help us with our problems of today, are we staying away from meetings of science groups that will stimulate us to finer teaching, are we saying we have no time for participation in extra science activities because of an already loaded program? Aren't these a part of our war-time job, a part that should not be postponed if we are to do our best work in the field that we have chosen? Isn't it really a part of our war-time patriotism to be up to date in our work, to be prepared and enthusiastic, and to pass that preparation and enthusiasm on to students and other teachers?

It is our teaching today that will be largely responsible for students choosing the field of science as their future work. The world has far greater need for sci-

entific knowledge today and tomorrow in the rebuilding of the war-affected countries and the advancement of our ideals and standards than ever before.

We, as teachers, have a great responsibility on our hands. Let us make the most of the opportunity. We shall then, literally, be helping our country with the greatest degree of patriotism, with a far more important task as to the future development of our country than any other in which we could participate. *Building man-power of tomorrow may have greater compensations than relieving the man-power shortage of today!*

BETTY LOCKWOOD,
Redford High School,
Detroit, Michigan

NEW YORK ASSOCIATION OF BIOLOGY TEACHERS

WHEREAS the recent election campaign revealed efforts on the part of some groups to incite prejudice among peoples of different religious, national and racial origins, and
WHEREAS incitement to prejudice and hate is fascism's powerful psychologic weapon for the achievement of the disunity it needs to establish itself, and
WHEREAS *The New York Association of Biology Teachers* has previously gone on record against bigotry and discrimination,
Be it therefore Resolved that our organization pledges itself to work for the eradication of these weapons of fascism and to help achieve instead a unified America. We further express the belief that the task of counteracting prejudices is the task not only of the biology teacher but of every teacher in the school system.

(The above resolution was passed unanimously at the Executive Board meeting on December 18, 1944.)

BEN BAUMAN,
Secretary

NOTES ON LOCALS

It is gratifying to see so much activity among several of our local groups. Meeting after meeting, reported to the Committee on Local Organizations, indicates the growth and the interest in such groups.

If your organization has not yet sent in the names of its officers, or if its name has not yet appeared in THE AMERICAN BIOLOGY TEACHER, why not get this done at once?

Among those who have been faithful in their reports are: *The New York Association of Biology Teachers, Chicago Biology Round Table, Biology Teachers Club of Southwestern Pennsylvania, Greater Cleveland Biology Club.*

The Southwestern Pennsylvania group continue to present their interesting mimeographed *Biology Notes* and they report most worthwhile meetings. For example, on February 10 they met in Carnegie Museum, where Dr. James Leroy Kay, Curator of Vertebrate Paleontology, spoke and then conducted the group through the department. They have a lot of "field trip" meetings of this sort, really taking advantage of the "biological spots" in their city.

The New York Association has been sponsoring some worthwhile projects; we are awaiting with interest reports of their more recent activities.

Chicago Biology Round Table meetings have been held monthly, generally in the central YMCA. Their secretary reports 127 members (to January 1945) and our president, Helen Trowbridge, says they have excellent meetings.

So, let's hear from some of you other folks; if you want to make a formal report that can be put into the permanent records, send for the regulation forms. Yours for better locals,

PREVO L. WHITAKER, *Chairman*
Committee on Local Organizations,
University High School,
Bloomington, Indiana

BY THE WAY

IF YOUR AQUARIUM is situated in a particular sunny spot, be sure to call the pupils' attention to the bubbles arising from the eelgrass or other aquatic plants. Make it a point to explain photosynthesis during a time when oxygen bubbles are rising.

A LUMP OF MODELLING CLAY is a useful classroom teaching device. It can be fashioned into a paramecium, chromosome, two-cell stage, or what-not, as needed and on the spur of the moment.

FOR IMITATION "FOSSILS" of leaves and other flat structures, place the specimen in the bottom of a dish, cover with plaster-of-Paris and allow the plaster to harden; then remove the specimen, leaving the imprint in the plaster.

WHEN THE BIOLOGICAL SUPPLY company sends you the newest edition of its catalogue, don't throw the old one into the wastebasket. It contains many pictures, charts, diagrams, etc., worth clipping and saving.

DIFFUSION AND OSMOSIS. Place several raisins in a beaker of distilled water. Note increase in size as water is taken in. After several hours, test the water with Fehling's solution for the presence of sugar.

FOSSILS should not be omitted from the biology course, if the school is located in a suitable area. In many sections of the country it is possible to find representatives of most of the major phyla of plants and animals in fossil form. The study of these in conjunction with the living representatives of the same phyla adds much to the interest and enjoyment of the course. And of course, the fossil hunting itself can be an exciting experience.

IF TREES ARE BEING CUT DOWN in your community, try to get a section of the trunk of one, about two or three inches thick, for a study of the annual rings. Determine the age of the tree and see whether you can correlate the variations in ring-width with the rainfall records over the period during which the tree lived.

A TEACHING MUSEUM may be started at any time. Let the pupils help as much as possible; label all acquisitions with such information as is available. Get help with the identification of specimens, if necessary, from your state university or from specialists in the field involved.

Incised Patterns In Clay Tiles

This note is supplemental to the article on clay models, published in the October, 1944,* issue. It could not be included there because of lack of space.

The accompanying figures are photographs of incision patterns on clay tiles, as described in the October article. The pattern is that of the cross section of the madreporic canal, or stone canal, of the water-vascular system of the starfish. Both negative and positive prints are shown, in order to bring out the pattern more effectively. The tiles are about three inches square and a half inch thick, but may be made in any desired size.

There is no limit to the number and kinds of subjects for such incisions, and even small children are interested in making them. A variety of "tools" may be used, as simple as a small pointed stick. The designs themselves may be as simple or as elaborate as desired. They may be colored and glazed for permanence, if they are worth placing in a collection.

* EVANS, GERTRUDE S., *Clay Models for the School Museum*, The American Biology Teacher, Vol. 7, No. 3, p. 51. December 1944.

Biological Briefs

STANFORD, E. E. *The Fungi and the War.* Nature Magazine 37: 288–294; 329. June–July, 1944.

We are learning new ways of making use of fungi as well as of fighting those injurious to our interests. There is scarcely a plant without its fungus enemy; stored foods, lumber, damp cloths, leathers, and human skin must be protected against attack. The development of wilt-resistant strains of plants and of new fungicides is progressing well. Pressure-treating with creosote prevents dry-rot as well as insect damage to lumber.

On the other hand, yeasts provide us with leavening for bread and with millions of gallons of industrial alcohol, and are depended upon as the principal source of concentrated B vitamins; there is also some experimentation on yeast products as meat substitutes. Germany may be using yeasts and other fungi to produce fats and glycerine. Fungi are used to produce several acids: gluconic (for calcium, gluconate in infant diets), citric, propionic (propionates inhibit unwanted molds in cheese and bread). Penicillin is a recently publicized fungus derivative for combating coccus infections, and work on other molds may lead to products of even greater power and wider application.

ROWE, DOROTHY P. *New Trees for Our Forests.* Nature Magazine 37: 352–354; 386. August–September, 1944.

We are at present cutting our trees faster than they grow. One solution is the development of fast-growing hybrid trees. Dr. Ernst J. Schreiner, with the U. S. Forestry Service, has developed strains of fast-growing poplars which attain pulpwood size in 10 to 15 years. Birches, ash, maples, oaks, and other forest trees of the northeast are also being hybridized. This process involves covering branches of unopened female flowers with glassine bags, introducing pollen when they are receptive, and collecting the seeds in cloth bags—all from swaying ladders or from perches on the tree itself. Desirable hybrids are then propagated from cuttings.

ARNOLD, OREN. *Emergency in Grass.* American Forests 50: 280–283. June, 1944.

Today's meat scarcity is due partly to a grass shortage which has been developing for three generations. Ninety per cent of our rangeland has been depleted of nutritious grasses by overgrazing over a period of 50 years, and cannot be restored without at least a decade of careful nursing. Regional investigation must determine how many cattle can be put on a known acreage and still allow the grass to come back. Twenty-five to fifty per cent of the average annual growth of grasses should be left on the ground each season. In Arizona, experimental plats show convincing results. Where grazing is reduced to permit the return of the grama grasses, the initial financial loss due to a smaller number of cattle per acre has soon been more than made up by a greatly increased calf drop and a heavier weight of individuals. In addition, the range shows the grass growth our grandparents first beheld, preventing and healing surface erosion. The technical facts are known; the people must now be educated.

RUTH SHERMAN STEIN

FAIRY SHRIMPS

These delicate little fresh-water crustaceans are most exciting animals for display in the biology laboratory—exciting because of their uncertainty and because of their rhythmic beauty. It is difficult to forecast their coming as they may appear year after year in some places and then suddenly be absent for a season or more. Their presence is not detected unless a dip-net is used and successive dippings examined carefully. Some high school students have accidentally caught them by dredging with glass jars.

The fairy shrimps show up early in the spring just after the ice has melted from shallow pools, usually pools of a stagnant nature, filled with fallen leaves, trash, algae and decaying organic matter. With the advent of warm weather they disappear leaving only the eggs which when extruded, fall to the pond bottom.

Ranging from one half inch to one inch in length, these transparent little fellows swim on their backs by a rhythmic beating of the "gill-feet." These plume-like appendages serve to extract oxygen from the shrimps' native element and also act as organs of propulsion. (The name *Phyllopoda*—leaf-feet—is

given to this order.) It is claimed that these "breathing-legs" take food bits and grind them towards the mouth cavity. Be that as it may, the beauty of the wave-like motion of the legs, perfectly coordinated, is something to hold the attention of any observer. The transparency of the body is often tinted with pink, brown or bronze, and the long narrow abdominal region is reddish from the haemoglobin.

The females, which predominate, stow their eggs in a pouch midway between the anterior and posterior ends on the under side (uppermost as the shrimp swims) and this egg-pouch is much darker than the surrounding tissues. The males may be smaller and fewer in numbers than the females, lack the egg-pouch of course, and have extensions on their second antennae which act as claspers in copulation.

When collecting living specimens for the laboratory, it is well to include some of the dead leaves and algal growth with which the fairy shrimps are associated, and to bring in several gallons of the water in which they live. Place the entire collection in a small aquarium or large battery jar (of the clear glass variety) and the little animals will furnish much worth-while study for a week or more.

Many species of fairy shrimps are found in North America, *Eubranchipus vernalis* Verrill being one of the common forms observed in the eastern parts.

Donald S. Lacroix
Amherst High School,
Amherst, Massachusetts

Editor's Note: It is a source of regret that this article arrived too late for the February issue, where it should have been in order to be in time for the southern part of the country. Because of the crowded schedule it could not be included in March. It seems wiser to publish it now, even though the fairy shrimp season is over in many parts of the country, than to postpone it for an entire year.

Fairy shrimps photographed in a water cell. Two females (with dark egg-pouches) and three males.

Reviews

Armstrong, W. Earl, Hollis, Ernest V., and Davis, Helen E., *The College and Teacher Education.* American Council on Education, Washington, D. C. x + 311 pp. 1944. $2.50.

This is a report of the planning and experimentation of six universities, five colleges, seven teachers colleges and two Negro colleges which took part in a nationwide study of teacher education. The large areas presented in separate chapters are *Implementing Student Personnel, Working on General Education, Emphasis on the Major Field, Patterns of Teacher Education, Recurring Emphases in Teacher Education, Colleges and Schools,* and *Integration and the Group Approach.* In each of these chapters are given detailed reports of the problems actually attacked in certain of the cooperating institutions. For example, the chapter on emphasis on the major field includes descriptions of the revision of the curriculum for teachers of agriculture, as carried on at North Carolina State College, relating the curriculum of the prospective teacher in the University of Texas to the needs of the teacher in the Texas public schools, and a joint project at Harvard dealing with the bases upon which the curriculum for the prospective teacher should be built. The plans and developments are carefully traced and documented with references to the reports of the institutions themselves. Each of the chapters treats three or four of the institutions in some detail, although any given institution may be mentioned in all of the chapters. In the final chapter the authors, after mentioning the difficulty of distinguishing exactly between general and strictly professional education, nevertheless suggest that "we should like to see some 80 to 85 per cent of the undergraduate's whole time in college given to general education and subject concentration. . . . The 15 to 20 per cent of the entire program we have reserved for professional education should begin in the freshman or sophomore year and lead up to the main emphasis, student teaching, not later than the first semester of the final year."

EVENDEN, E. S., (Chairman, commission on Teacher Education) *Teachers for Our Times*, American Council on Education, Washington, D. C. xix + 179 pp. 1944. $2.00.

"Who are the teachers of the United States?" This is the opening sentence of a compact, four-chapter book which is essentially a statement of purposes. Chapter I gives some answers to the question, in terms of the extent of the profession. In the "average" community of 10,000, 75 will be teachers, as compared to 13 lawyers, 13 physicians, 10 clergymen and 6 dentists. In ordinary years there are some 285,000 prospective teachers enrolled in the colleges and universities of the country. The second chapter presents an analysis of the nation, its people and its dominant social trends, and discusses ways in which schools and teachers must be developed to meet the special needs of democratic planning and management. The function of education and the responsibilities of the schools comprise the subject matter of the third chapter, entitled *Our Children, Our Schools*, in which the great variety of abilities and environmental backgrounds is emphasized. The last chapter, *Teachers for Our Times*, is a discussion of the kinds of person that should be sought for teachers. Here again, much is made of the diversity of needs and the dangers of trying to find a mechanically perfect answer. This reviewer would like to ask one more question. How often have we who are teachers known students who have all the traits of the "born teacher" sticking out all over them, only to hear them say "Oh, I don't want to teach—I'd rather do most anything else." How shall we go about attracting these fine young people, who would so obviously make grand teachers, into the profession?

POPE, CLIFFORD H. *Amphibians and Reptiles of the Chicago Area*. Chicago Natural History Museum. 273 pp. paper, illus. 1944. $1.75.

This excellently illustrated, clearly written handbook describes 10 species of salamanders, 11 frogs and toads, 3 lizards, 18 snakes and 10 turtles found in the "Chicago area," which includes 3 counties in Wisconsin, 9 in Illinois, 6 in Indiana, and one in Michigan. No point in this area is more than 70 miles from the center of Chicago.

The book does not avoid technical words where these are necessary for accuracy, but keeps them to a minimum and explains them as they occur. Details of identification, sexual differences, life history, habits, economic importance, life in captivity and geographic distribution are given for each species. There are 50 text figures and 12 plates, 6 of the latter in color. Taxonomic details are almost entirely omitted, but related subspecies are sometimes indicated. A few references are listed, these being so chosen as to direct the reader to more extensive accounts of the species indicated. The index is adequate and well organized. This book should be a valuable addition to both private and school libraries, even far outside of the Chicago area.

ELLIOT, ALFRED M. *Atlas in General Biology*. Published by the author, State Teachers College, Bemidji, Minnesota. 62 Zoology Plates, $1.20, 24 Botany Plates, 50 cents. 1944.

This set of plates is intended to accompany any general course in biology. The plates are $8\frac{1}{2} \times 11$ inches, punched for the standard 3-ring notebook, supplied unbound in an envelope, so that the student may arrange them in whatever order suits the course in which he is using them. The author refers to the plates as charts in miniature, which is almost a description of them. The following random list of topics will give some idea of the scope of the plates: Cell, Tissues, Malaria, Hydra, Planaria, Life History of Liver Fluke, Ascaris, Earthworm, Serial Homologies, Insect Metamorphosis, Amphioxus, Muscles of Cat and Man, Vertebrate Appendages, Digestive System, Heart, Endocrine Glands, Urogenital System, Germ Cell Cycle, Symbiosis, Mitosis in Plant Cells, Algae, Bacteria, Wheat Rust, Fern Life History, Leaves, Nitrogen Cycle, Pollination, Seeds and Fruits. These "charts in miniature" enable the student to take along from the lecture room a pictorial account of some of the major points that were covered. These may be combined with the student's own drawings and notes in a great variety of ways, depending on the nature and extent of the course and the manner of presentation.

FILMSTRIPS FOR SCHOOLS

Thirty-three filmstrips which deal with contemporary life in the United States were released recently by the AMERICAN COUNCIL ON EDUCATION. Originally produced by the Council in cooperation with the Office of the Coordinator of Inter-American Affairs for Latin American distribution, the filmstrips offered so much valuable material for our own schools that arrangements have been completed for distribution in this country.

Seven of the titles deal with the regional geography of the United States. The first provides a panorama. The six succeeding subjects take up the individual regions in more detail bringing out regional characteristics in terms of climate, topography, people, industries, and products as well as indicating the interdependence of the different regions.

Some subjects are documentary treatments

which bring to the student the flavor of life in a situation different from his own. National parks and forests, important aspects of flood control, irrigation, harnessing water power, rural electrification and soil conservation are treated in other filmstrips. A number of subjects present material closely related to health topics. Of particular interest to biology teachers are *Forests of the United States, Forest Ranger, Soil Conservation, Urban Clinic, Rural Public Health, Registered Nurse, Nutrition, Civilian Conservation Corps, National Parks of the United States.*

The filmstrips were produced by the Council under the direction of Milton R. Tinsley, formerly with the Office of War Information and the Farm Security Administration. Each is accompanied by a script which may be read as a running commentary during projection, or may be used as a teacher's guide. Ample background material is included.

The filmstrips are for sale only. They are priced at $1.50 each; any seven for $10.00; the complete set of 33 for $45.00. Prices include two copies of the English script for each filmstrip. For complete information write to the American Council on Education, 744 Jackson Place, Washington 6, D. C. A catalog is now available and preview prints will be supplied on request.

GUIDE TO EVALUATION OF EDUCATION IN ARMED SERVICES

One of the most valuable and practical tools to aid in the educational readjustment of veterans has just been issued by the American Council on Education. This is a *Guide to the Evaluation of Educational Experiences in the Armed Services,* compiled for the Council under the direction of George P. Tuttle of the University of Illinois with the cooperative support of nineteen regional and national accrediting associations. The loose-leaf handbook will be indispensable for any institution which expects to evaluate fairly the educational experiences of men and women who served in the military forces. The armed forces have themselves ordered more than 10,000 sets of the book.

George F. Zook, president of the Council, called the *Guide* "the most valuable single contribution to assure fair treatment of returning veterans." He said, "In a very real sense, this is a qualitative catalogue for civilians describing and measuring the widespread, varied and complex educational and training programs of the Army, Navy, Coast Guard and Marine Corps."

The handbook has been in preparation throughout the spring and summer. The first section of 271 pages includes: (1) an introductory statement about the general problem; (2) information concerning the United States Armed Forces Institute, the Marine Corps Institute, the Coast Guard Institute, and the off-duty program of the Navy; (3) evaluation in terms of secondary school and college credit of correspondence courses offered by the Armed Forces Institute, the Marine Corps Institute, and the Coast Guard Institute; and (4) summaries and recommendations in terms of secondary school and college credit of 166 service schools and courses in the Army, Navy, Marine Corps, and Coast Guard. These summaries indicate for each school or course the location, length, objective, plan of instruction, description of subjects, and recommendations as to credit.

Future sections of the *Guide* will contain a discussion of the various examinations prepared by the Armed Forces Institute, lists of such examinations available, credit values of the examinations and critical scores; evaluation of further correspondence courses offered by the Armed Forces Institute, and the Coast Guard Institute; a discussion of and recommendations concerning self-study service training courses in the Navy; and summaries and recommendations concerning a large additional number of formal service schools and courses.

Subscriptions to the *Guide* are $2.00 a set. Orders should be mailed to 363 Administration Building, Urbana, Illinois.

ELECTION NOTICE

(*The Nominating Committee appointed by the Executive Board has submitted the following list of nominees for offices of The National Association of Biology Teachers for the ensuing year. The Secretary-Treasurer will send ballots to all members.*)

For President-elect:

Ollie E. Fink, Executive Secretary, Friends of the Land, Columbus, Ohio; A.B., M.A., Ohio State; high school teacher and supervisor in Ohio schools, 1927 to 1938; Supervisor of Conservation Education, Zanesville Public Schools, 1938–39; Curriculum Supervisor of Conservation Education, State Department of Education, 1939–44; Chairman of Conservation Committee, U. S. Junior Chamber of Commerce, 1937–8; author of *The Teacher Looks at Conservation, Conservation for Tomorrow's America, Nutrition for Health, Our Nation's Health Lies in the Soil* (Am. Biol. Tchr. Mar. 1944).

E. Laurence Palmer, Professor of Rural Education, Cornell University; A.B., A.M., Ph.D., Cornell; four years teaching at Iowa State Teachers College; director of Nature Education for Nature Magazine; President, Department of Science Instruction, Nat. Ed.

Assn., 1929; Secretary (1925–8) and President (1935–7) of Nature Study Society; Advisory Board of Nat. Assn. of Biol. Tchr.; Editor of *Cornell Rural School Leaflet;* Chairman of Conservation Committee of Nat. Assn. of Biol. Tchr.; author of numerous publications in Conservation and Rural Education.

For First Vice President:

CURRAN M. FARMER, Head of Science Department, State Teachers College, Troy, Alabama; A.B., Iowa Christian College, M.A. North Carolina; principal of elementary and high schools, instructor in Atlantic Christian and Lynchburg Colleges, author of two books and numerous pamphlets; President (1940–1) Alabama Academy of Science.

BETTY LOCKWOOD, biology teacher, Redford High School, Detroit, Michigan, B.S., Wayne University, M.A., Cornell, grad. work, Chicago; Comm. on Visual Educ., Am. Counc. on Educ.; Chm. Biol. Conf., Mich. Schoolmaster's; Chm. Detroit Regional Meeting, 1942; guest editor, Ornithology Issue; special interest, Conservation.

For Second Vice President:

LUCILE EVANS, Milwaukee State Teachers College, Milwaukee, Wisconsin; A.B., Milwaukee-Downer, M.S., Chicago, grad. work, Marquette University; instructor in Wausau and Oshkosh high schools; past president and secretary, biology section of Wis. Educ. Assn.

GJERTRUD H. SMITH, Los Angeles City Schools, Los Angeles, Cal.; B.S., Univ. of Cal. at Los Angeles; instructor and health coordinator in Los Angeles High Schools; member of various scientific, public health and general education organizations; president South. Cal. Assn. of Life Sci. Tchrs.

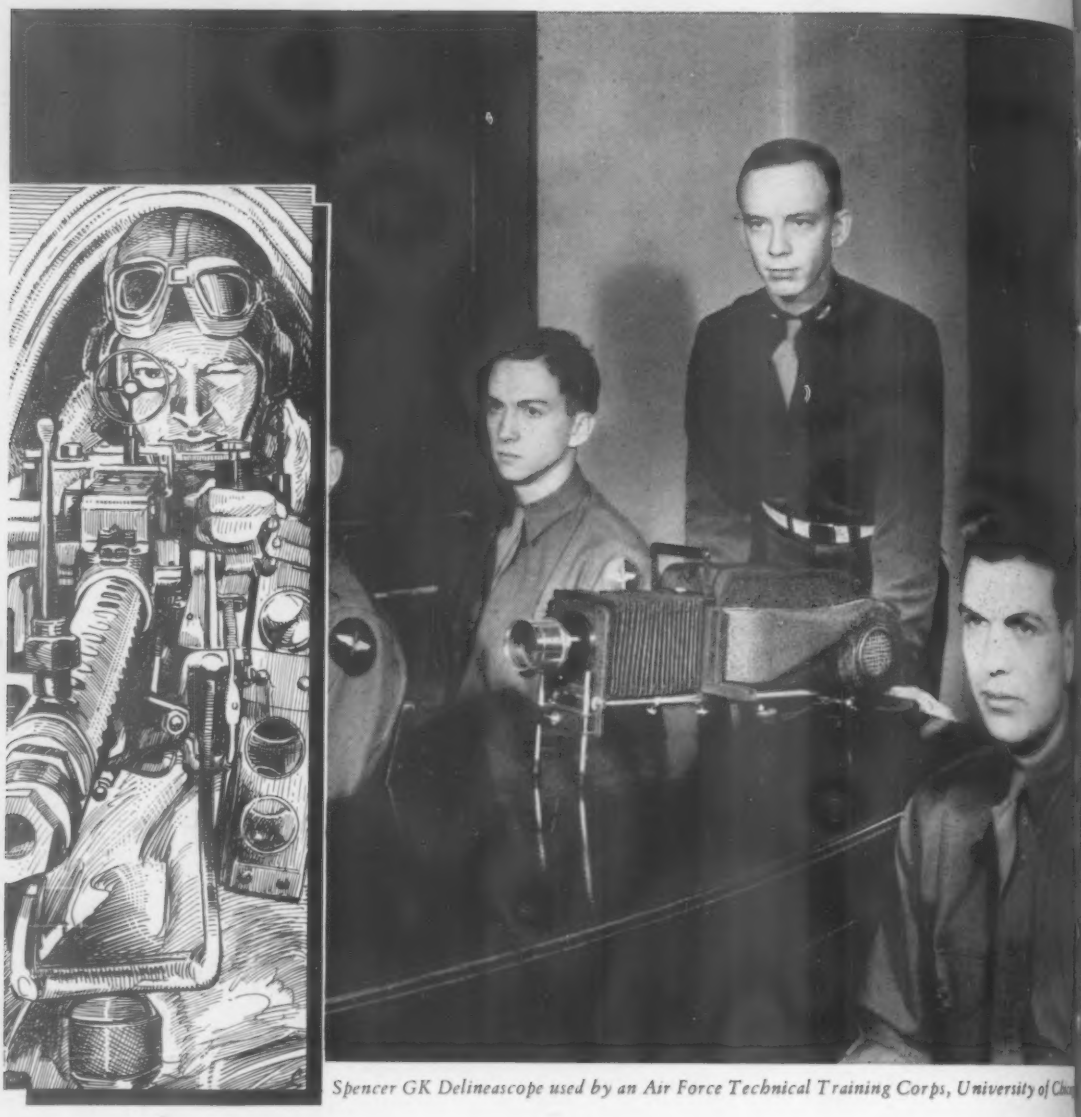
For Secretary-Treasurer:

M. A. RUSSELL, present incumbent.

LADY BEETLES WANTED

The undersigned is prepared to buy collections of lady beetles from anywhere in North America. Dry specimens will usually suffice; only occasionally will live beetles be needed. Offers are invited.

A. FRANKLIN SHULL, *Dept. of Zoology*
University of Michigan Ann Arbor, Mich.



Spencer GK Delineascope used by an Air Force Technical Training Corps, University of Chi

Seeing and Learning *Quickly*

In the first 28 months of its existence, the Army Air Force Technical Training Command turned out more than 500,000 ground and combat crew technicians. An amazing total contrasted with the record of the preceding 20 *years* during which the Army Air Corps had graduated only 14,803 such technicians.

One factor which is helping to instruct such unprecedented numbers in so short a period is the use of visual methods. Spencer Delineascopes are in daily service in this vital work.

ARMY E NAVY

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AMERICAN OPTICAL COMPANY